Name: Date:

**Stoichiometry HW #1**

*Show your work and include all units.*

1. Ammonia is synthesized from hydrogen gas and nitrogen gas according to the following ***unbalanced*** equation:

\_\_\_\_\_\_\_ N2 + \_\_\_\_\_\_\_ H2 → \_\_\_\_\_\_\_ NH3

If an excess of nitrogen is reacted with 3.41 moles of H2, how many moles of NH3 can be produced?

1. In the decomposition of potassium chlorate (KClO3), 80.5 moles of O2 form. How many moles of potassium chloride, the other product, will be formed? The ***unbalanced*** chemical equation for this reaction is:

\_\_\_\_\_\_\_ KClO3 → \_\_\_\_\_\_\_ KCl + \_\_\_\_\_\_\_ O2

1. In a single displacement reaction, 10 moles of aluminum react with excess HCl according to the following ***unbalanced*** reaction:

\_\_\_\_\_\_\_ Al + \_\_\_\_\_\_\_ HCl → \_\_\_\_\_\_\_ AlCl3 + \_\_\_\_\_\_\_ H2

How many moles of H2 gas will be produced?

1. How many moles of sodium oxide are produced by the reaction of 1.44 moles of sodium according to the following ***unbalanced*** reaction?

\_\_\_\_\_\_\_ Na + \_\_\_\_\_\_\_ O2 → \_\_\_\_\_\_\_ Na2O

1. How many moles of lead(II) nitrate will be needed to react with sodium chromate to produce 4.62moles of lead(II) chromate according to the following ***unbalanced*** chemical equation? Be careful identifying which compound is which!

\_\_\_\_\_\_\_ Pb(NO3)2 + \_\_\_\_\_\_\_ Na2CrO4 → \_\_\_\_\_\_\_ PbCrO4 + \_\_\_\_\_\_\_ NaNO3

1. How many moles of H2 gas are formed when 0.85 moles of lithium reacts with water according the to following ***balanced*** equation?

**2** Li + **2** H2O → **2** LiOH + H2

1. Glucose (C6H12O6) is the source of energy by the human body. The overall ***balanced*** chemical equation is:

C6H12O6 + **6** O2 → **6** CO2 + **6** H2O

Calculate the number of moles of oxygen gas needed to oxidize (aka. react with) 12.5 moles of glucose to form carbon dioxide and water.

1. Some types of cancer can be effectively treated by a compound called cisplatin, PtCl2(NH3)2. Cisplatin is produced synthetically by the following ***balanced*** equation:

K2PtCl4 + **2** NH3 → **2** KCl + PtCl2(NH3)2

Determine the number of moles of cisplatin produced from 2.55 moles K2PtCl4 reacting with excess ammonia.